

Patent Claims

1. A light source with a microstructured optical element which spectrally spreads the light from a primary source, and with optics which form the spectrally spread light to form an illumination light beam, characterized in that the optics compensate for the different divergences of the spectral components of the spectrally spread light.
2. The light source as claimed in claim 1, characterized in that the optics have a different focal length for light at different wavelengths.
3. The light source as claimed in one of claims 1 or 2, characterized in that the optics focus the shorter wavelength spectral components of the spectrally spread light more strongly than the longer wavelength spectral components of the spectrally spread light.
4. The light source as claimed in one of claims 1 to 3, characterized in that the microstructured optical element includes photonic bandgap material.
5. The light source as claimed in one of claims 1 to 4, characterized in that the microstructured optical element is in the form of an optical fiber.
6. The light source as claimed in claim 5, characterized in that the microstructured optical element has a taper (tapered fiber).
7. The light source as claimed in one of claims 5 or 6, characterized in that the microstructured optical element is a photonic crystal fiber (microstructured fiber, Holey fiber).

8. The light source as claimed in one of claims 1 to 7, characterized in that a diaphragm is provided which masks out the edge beams of the spectrally spread light.

5

9. The light source as claimed in one of claims 1 to 8, characterized in that the optics are a component of a microscope, in particular of a scanning microscope or of a confocal scanning microscope.

10

10. The light source as claimed in one of claims 1 to 9, characterized in that the optics are an objective.

15

11. The light source as claimed in one of claims 1 to 8, characterized by use in a flow cytometer, an endoscope, a chromatograph or a lithography apparatus.

20

12. A microscope which includes a light source with a microstructured optical element which spectrally spreads the light from a primary source, and with optics which form the spectrally spread light to form an illumination light beam, characterized in that the optics compensate for the different divergences between the spectral components of the spectrally spread light.

25

13. The microscope as claimed in claim 12, characterized in that the optics have a different focal length for light at different wavelengths.

30

14. The microscope as claimed in one of claims 12 or 13, characterized in that the optics focus the shorter wavelength spectral components of the spectrally spread light more strongly than the longer wavelength spectral components of the spectrally spread light.

35

15. The microscope as claimed in one of claims 12 to 14, characterized in that the microstructured optical element includes photonic bandgap material.

16. The microscope as claimed in one of claims 12 to 15, characterized in that the microstructured optical element is in the form of an optical fiber.

5

17. The microscope as claimed in claim 16, characterized in that the microstructured optical element has a taper (tapered fiber).

10 18. The microscope as claimed in one of claims 16 or 17, characterized in that the microstructured optical element is a photonic crystal fiber (microstructured fiber, Holey fiber).

15 19. The microscope as claimed in one of claims 12 to 18, characterized in that the optics are an objective.

20 20. The microscope as claimed in one of claims 12 to 19, characterized in that the microscope is a scanning microscope, in particular a confocal scanning microscope.